The Quran On ASTRONOMY

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Chapter 1

Science in the Quran

The Qur'an was revealed in the seventh century. Many statements pertaining to physical phenomena are dispersed throughout the Qur'an. These are there in the Qur'an to draw the attention of people to the wonders of Allah's creation. Any other seventh century book making statements about the physical universe would surely contain mistakes. Our knowledge of physical sciences in the twentieth century is far advanced beyond the imagination of people living in the seventh century. What will come as a surprise to many people is that of all the numerous statements about scientific matters found in the Qur'an, not one of those have proved contrary to the established facts of science. On the other hand, many of those statements have already been verified by modern scientific studies, and we confidently expect that as various fields of knowledge advance, other Quranic statements will likewise prove true.

Let us look at some of the statements which science has already verified.

Chapter 2

THE FUSING AND SEPARATING OF THE HEAVENS AND THE EARTH

How do modern scientists explain the formation of the universe? Dr. Maurice Bucaille explains it in his book, The Bible, the Qur'an and Science, as follows: "The basic process in the formation of the universe … Lay in the condensing of material in the primary nebula followed by its division into fragments that originally constituted galactic masses. The latter in their turn split up into stars that provided the subproduct of the process, i.e. the planets" (p. 149). Does the Qur'an say anything about this condensing and separation of the primary material to result in the formation of our universe? Let's have a look. The creator, Allah, says in his final
book: **"Do not the unbelievers see that the heavens and the earth were fused together, then we separated them … " (Qur'an 21:30).**
Dr. Bucaille sees this as "the reference to a separation process of a primary single mass whose elements were initially fused together" (p.143). Thus the Qur'an gives an accurate account of the formation of the universe to call upon humankind to recognize the power of their creator.
This raises an interesting question: How could a man living in the seventh century invent these ideas which could not be confirmed until modern times? And how could he in so doing avoid the mythical and fanciful ideas prevalent in human history? Dr. Bucaille mentions some of these myths for contrast: "When, as in Japan, the image of the egg plus an expression of chaos is attached to the above with the idea of a seed inside an egg (as for all eggs), the imaginative addition makes the concept lose all semblance of seriousness. In other countries, the idea of a plant is associated with it; the plant grows and in so doing raises up the sky and separates the heavens from the earth. Here again, the imaginative quality of the added detail lends the myth its very distinctive character" (p. 152).

In contrast to those myths, the Qur'anic statements are "free from any of the whimsical details accompanying such beliefs; on the contrary, they are distinguished by the sober quality of the words in which they are made, and their agreement with scientific data" (p. 152).
It must be that the Qur'an is not the product of any human or humans, but a revelation from Allah. The Qur'an says: **"The revelation of the scripture whereof there is no doubt is from the Lord of the Worlds" (Qur'an 32:2).**

The Sun is a star that is roughly 4.5 billion years old, according to experts in astrophysics. It is possible to (distinguish a stage in its evolution, as one can for all the stars. At present, the Sun is at an early stage, characterized by the transformation of hydrogen atoms into helium atoms. Theoretically, this present stage should last another 5.5 billion years according to calculations that allow a total of 10 billion years for the duration of the primary stage in a star of this kind. It has already been shown, in the case of these other stars, that this stage gives way to a second period characterized by the completion of the transformation of hydrogen into helium, with the resulting expansion of its external layers and the cooling of the Sun. In the final stage, its light is greatly diminished and density considerably increased; this is to be observed in the type of star known as a 'white dwarf'.

The above dates are only of interest in as far as they give a rough estimate of the time factor involved, what is worth remembering and is really the main point of the above, is the notion of an evolution. Modern data allow us to predict that, in a few billion years, the conditions prevailing in the solar system will not be the same as they are today. Like other stars whose transformations have been recorded until they reached their final stage, it is possible to predict an end to the Sun. The second verse quoted above (sura 36, verse 38) referred to the Sun running its course towards a place of its own. Modern astronomy has been able to locate it exactly and has even given it a name, the Solar Apex: the solar system is indeed evolving in space towards a point situated in the Constellation of Hercules (alpha lyrae) whose exact location is firmly established; it is moving at a speed already ascertained at something in the region of 12 miles per second. All these astronomical data deserve to be mentioned in relation to the two verses from the Qur'an. Since it is possible to state that they appear to agree perfectly with modern scientific data.

Chapter 3

FROM A GASEOUS MASS TO THE HEAVENS AND THE EARTH

Concerning the creation of the heavens and the earth, the Qur'an says that prior to the creation, the Heaven was smoke. God then commanded it and the earth to come into being and they came willingly (see surah 41:1 1). How does that compare with modern scientific explanations? Let us hear a scientific explanation and then judge for ourselves.

The French scientist Dr. Maurice Bucaille in his book called The Bible, the Qur'an and Science explains: "At the earliest time it can provide us with, modern science has every reason to maintain that the universe was formed from a gaseous mass principally composed of hydrogen and a certain amount of helium that was slowly rotating" (p.147). (Big Bang Theory)

Didn't the Qur'an say that the Heaven was smoke before its creation? Dr. Bucaille explains the connection between his description and that of the Qur'an as follows: "Smoke is generally made up of a gaseous substratum, plus, in more or less stable suspension, fine particles that may belong to solid and even liquid states of matter at high or low temperature" (p. 143).

He therefore sees no contradiction of the Quranic use of the Arabic word dukhan (translated smoke) and a modern interpretation of that word as a gaseous mass with fine particles when speaking of the formation of the universe.

We notice here two remarkable features of the Qur'an. The first feature is that it expresses scientific truths that will be verified many centuries later. The second feature is that the Qur'an expresses those truths using terms and expressions that would avoid confusing its first readers in the seventh century. The seventh century reader of the Qur'an can easily

relate to the image of smoke, and the twentieth century scientist can easily interpret the word as a gaseous mass.

Chapter 4

AVOIDING THE MISTAKES OF GENESIS

As we saw in chapter 2, both the Quran and modern science confirm that the heavens and the earth were created simultaneously, having been separated from a primary nebula. It is important to understand that the Bible, the most famous record of the creation prior to the Quran gives a sequence for the creation of the heavens and the earth that is today found unacceptable from a scientific standpoint. If the Quran was the work of human beings it is difficult to imagine how they could have avoided the human errors so firmly fixed in the minds of people from the previous records.

In the Bible, in Genesis, chapter 1, we read that God created light which He called day, and separated it from the darkness which He called night (see v. 3). Today we know that the alternation of day and night is caused by the earth's movement in relation to the sun. But, according to Genesis, the sun was not created until the fourth day (see v. 16). So how could day and night alternate before that?

A related problem is that vegetation is created on the third day (see vv. 11-12) whereas the sun which is necessary for sustaining vegetation does not appear until the fourth day.

"What is totally untenable" says Dr. Bucaille, "is that a highly organized vegetable kingdom with reproduction by seed could have appeared before the existence of the sun" (The Bible, the Quran and Science, p. 42).

We have already seen that the Quran states, and modern science confirms, that the heavens and the earth were formed together. Dr. Bucaille explains as follows: "Earth and moon emanated, as we know, from their original star, the sun. To place the creation of the sun and moon after the creation of the earth is contrary to the most firmly established ideas on the formation of the elements of the solar system" (p. 42). By giving a sequence in which the sun and moon are created after the creation of the earth, the Genesis account proves erroneous. On the other hand, the

Quran, by speaking of the simultaneous creation of the heavens and the earth, has judiciously avoided the errors of the Genesis account.
Could the Quran have been authored by a human? No! Dr. Bucaille asks: "How could a man living fourteen hundred years ago have made corrections to the existing description to such an extent that he eliminated scientifically inaccurate material and, on his own initiative, made statements that science has only in the present day been able to verify?" (p.151). (Dr. Bucaille was not born a muslim, but after reading the Quran and seeing how the Quran goes in such details into Science he converted to Islam.)
SIX DAYS OF CREATION OR SIX PERIODS? Today we know that the creation process can be measured in billions of years.

The priestly editors or the Bible could not have known this. In their eagerness to enjoin Sabbath observance on others they wrote that God rested on the very first Sabbath day after finishing up his work of creating the heavens and the earth.
The six days of creation in the book of Genesis, then, are clearly like six days of any seven-day week. The Priestly editors have made it clear that a day is meant a period from one sunset to another. Six days meant from Sunday to Friday. They believed that the reason the Sabbath day became holy is that God Himself had rested on that day. Thus the editors tell us: "By the seventh day God had finished the work he had been doing; so on the seventh day he rested from all his work. And God blessed the seventh day and made it holy, because on it he rested from all the work of creating that he had done" (Genesis 2:2).
If that is not far enough, the editors took the idea that God rested farther still when they wrote as follows:

"In six days the Lord made heaven and earth, and on the seventh day he rested, and was refreshed" (The Holy Bible, King James Version, Exodus 31: 17).
The idea that God rests like humans and gets refreshed like humans had to be corrected by Jesus, on whom be peace, when, according to John, he declared that God never stops working, even on the Sabbath day (see John 5:16). God clarified the matter in His own words when he declared: **"And verily we created the heavens and the earth and all that is between them in six days, and naught of weariness touched us" (Quran 50:38 see also v. 15).**

The above quranic verses clearly refute the idea that God rested. God, according to the Quran does not get tired. Neither slumber nor sleep overtakes him (Quran 2:255).

But how about the period of creation? Was that six days in the Quran too? In the above quotation from the Quran the term translated 'days' could mean, according to Dr. Maurice Bucaille, "not just 'days', but also 'long periods of time', an indefinite period of time (but always long)" (The Bible, the Quran and Science, p. 139).

Dr. Bucaille notes that the Quran also speaks of **"a day whereof the measure is a thousand years of your reckoning" (Quran 32:5). The Quran also speaks of a day whereof the measure is 50,000 years" (Quran 70:4).**

Dr. Bucaille also points out that long before our modern ideas of the length of time involved in the creation, commentators of the Quran understood that when the Quran speaks of six days of creation, it does not mean six days like ours, but rather six periods. Abu al Su'ud, for example, writing in the sixteenth century, understood it as six events (see The Bible, the Quran and Science, p.l39).

Again, we see that the Quran has avoided repeating an error which was established in a previous book an error that will not be discovered until modern times. In view of this, can anyone insist that the Quran is the work of a man?

Chapter 5

HOW OLD IS THE EARTH?

The Bible provides a chronology of history that extends back to the creation of Adam and Eve and to the creation of the earth. From this chronology it is possible to determine the date of the creation and hence the age of the earth.

Archbishop Ussher of Armagh (1581-1657) had calculated the year of creation to be 4004 BC If that was not precise enough, Dr. Lightfoot of Cambridge worked out that the exact time when God completed His creation was 9 a.m. on Friday, October 23, 4004 BC (see the book 7whinking about God by Sr. R. W. Maqsood, p. 63).

Many religious groups and sects have used this date in predicting precise dates for the end of the world, but all such predictions have so far proved erroneous. The one fact against them is that the world is still intact and we are very much alive.One reason al1 of those predictions failed is that they are calculated from a false date of creation. If 4004 BC was the year of creation, that would make the earth less than six thousand years old. No scientist can accept this today.

Modern scientists estimate that the earth is 4.5 billion years old with a maximum error of 2.2 % (see The Bible, the Quran and Science, p. 148). Knowing this, many educated people lost faith in religion. (Judaism & Christianity) They naturally felt that the Word of God should not contain errors of this kind. Others maintain that the Word of God was meant to teach only that truth which God wanted put into the scriptures for our salvation It if therefore immaterial if the book contains historical or scientific errors. As the scientist Galileo put it, the Bible is there to teach people how to go to heaven; it is not there to teach people how the heavens go. Some maintain, therefore, that it is understandable that the book will contain some historical and scientific errors since it was written by human beings who lived a long time ago and did not share our modern knowledge. (The Quran completely refutes this idea. The Quran does not

contain any Scientifical mistakes like the Bible does. Did man write the Bible or God. If not God than why do they say the Holy Bible is the Word of God) The Quran, on the other hand, does not contain any historical or scientific or any kind of error. God challenges us to test this claim by examining the book for ourselves (see Quran 4:82).

The Quran does not repeat the incorrect biblical chronology we have seen above. The Quran does not give a chronology since its purpose is not to provide us with the details of history, but only to teach us the lessons arising from specific events in history.

The Quran does, however tell us that God measured the sustenance of the earth in four periods (Quran 41 :10). As to what could be the significance of these four periods, Dr. Bucaille comments as follows: "One could perhaps see in them the four geological periods described by modern science, with man's appearance, as we already know, taking place in the quaternary era. This is purely a hypothesis since nobody has an answer to this question" (The Bible, the Quran and Science, p. 150).

How did the author of the Quran avoid the mistake in chronology committed by so many others, and believed in by so many others even up to our present day? Could a man in the seventh century have known that the earth was much more than six thousand years old? How could he come by this modern knowledge unless God was revealing knowledge to him?

God tells us that the Quran is His book and not the work of any man (see Quran 10:37).

Chapter 6

INTERSTELLAR GALACTIC MATERIAL

The Quran mentions a rather curious category of created things, namely things between the heavens and the earth. Dr. Bucaille observes that this mention in the Quran "may surprise the twentieth century reader of the Quran" (The Bible, tl1e Quran and Science, p. 144). For example, one verse says as follows: **"To Him (God) belongs what is in the heavens, on earth, between them and beneath the soil" (Quran 20:6; other verses include 25:59, 32:4 and 50:38).**
What is that between the heavens and the earth? Dr. Bucaille explains as follows: "The creation outside the heavens and outside the earth is a priori difficult to imagine. To understand these verses, reference must be made to the most recent observations on the existence of cosmic extragalactic material, and one must indeed go back to ideas established by contemporary science on the formation of the universe ... " (p. 145).

Scientists tell us that a primary nebula condensed, then divided up into fragments. These fragments, these galactic masses, further split up into stars and their sub-products, the planets. Each time such a division or split occurred, there remained extra material apart from the principal elements newly formed. The scientific name for these extra materials is 'interstellar galactic material'.

Is this extra material significant? Yes. Experts in astrophysics are quite aware of such material which have "a tendency to interfere with photometric measurements" (The Bible, the Quran and Science, p. 149). The extra material is so rarefied that they may be referred to as dusts or smokes or gases. Yet they altogether occupy so much total space that they may correspond to "a mass possibly greater than the total mass of the galaxies" (p. 149).

Again, we must face up to the implication of all this. How could a man living fourteen hundred years ago have known about interstellar galactic

material? Was Muhammad, on whom be peace, well versed in modern astrophysics? Or is the Quran nothing but the Word of God? Allah, the only true God, declares in His book: **"The revelation of the scripture is from Allah, the Mighty, the Wise. Surely We [Allah] have revealed the scripture unto you [Muhammad] with truth; so worship Allah, making religion pure for Him (only)" (Quran 39:1-2).**

Chapter 7

FORMATION OF IRON!

This is no less than a reminder to (all) the worlds. And you shall certainly know the truth of it (all) after a while. (Qur'aan 38:87-88).

Thus, the Qur'aan is a reminder for all of mankind until the Last Hour. It contains information that man discovers in due time. Because this Qur'aan was revealed from Allah's knowledge and every single verse in it was revealed with Allah's knowledge, as He Himself said:
Professor Armstrong works at NASA, otherwise known as the National Aeronautics and Space Administration, where he is a well-known scientist there. We met with him and asked a number of questions about Qur'aanic verses dealing with the expertise in Astronomy. We asked him about Iron and how it was formed. He explained how all the elements in the earth were formed. He stated that the scientists have come only recently to discover the relevant facts about that formation process. He said that the energy of the early solar system was not sufficient to produce elemental Iron.

In calculating the energy required to form one atom of iron, it was found to be about four times as much as the energy of the entire solar system. In other words, the entire energy of the earth or the moon or the planet Mars or any other planet is not sufficient to form one new atom of iron, even the energy of the entire solar system is not sufficient for that. That is why Professor Armstrong said that the scientists believe that iron is an extraterrestrial that was sent to earth and not formed therein. We read to him the Qur'aanic verse saying: **And we sent down Iron, in which is Great might, as well as many benefits for mankind (Qur'aan 57-25).**Then we asked him about the sky and whether it had any gaps or rifts in it. He disproved this and replied that what we are talking about is a branch of Astronomy called the "Integrated Cosmos" which we scientists have only come to know recently. For example, if you have a body in outer space which travels a certain distance in any direction and then

travel the same distance in a different direction, you will find that the mass weight is the same in all directions. Because this body has its own equilibrium, the pressures from all directions are the same. Without this equilibrium, the whole universe would collapse. I recalled Allah's verse in the Qur'aan: **" Do they not look at the sky above them? How we have made it and adorned it, and there are no flaws in it?" (Qur'aan 50:6).** Then we talked to Professor Armstrong about the attempts of scientists to reach the edge of the universe, and we asked him whether they were successful in this. He replied that they are fighting an uphill battle to the edge of the universe, we construct more powerful equipment to observe the universe only to discover that the new stars we see are still within our galaxy and that we have not yet reached the edge of the universe. He is aware of the Qur'aanic verse which says: **And we adorned the lowest heaven with lamps and we made such (lamps) missiles to drive away satans. (Qur'aan 67:5).**

Indeed, all these stars are adornments for the lowest heaven. He says that scientists have not reached the end of the universe. Professor Armstrong added that because of this, they are thinking of stationing more telescopes in outer space so that their observations will not be obstructed by dust and other atmospheric impediments. Vision telescopes using light are unable to travel long distances, so we replaced them with radio operated ones enabling us to see further, but we nevertheless are still within the boundaries. I mentioned to him this verse: **So turn thy vision again: Do you see any flaw? Again turn your vision a second time: (your) vision will come back to you dull and discomfited, in a state worn out (Qur'aan 67:3-4).**

Each time Professor Armstrong told us some scientific fact, we mentioned to him the relevant verse which he agreed with. Then said to him: 'You have seen and discovered for yourself the true nature of modern Astronomy by means of modern equipment, rockets, and space ships, developed by man. You have also seen how the same facts were mentioned by the Qur'aan 14 centuries ago, so what is your opinion about these?

He replied: That is a difficult question which I have been thinking about since our discussions here. I am impressed that how remarkably some of the ancient writings seem to correspond to modern and recent Astronomy.

Chapter 8

HOW MANY EARTHS ARE THERE?

If you open the Quran to the first surah, you will notice it begins as follows: "In the name of Allah, the Beneficent, the Merciful. Praise be to Allah, Lord of the Worlds." Worlds? Not just one? Yes … worlds! There is the physical world, the spiritual world, the world of bacteria, and so forth. That, obviously, is one sense in which we can understand 'worlds'.

Another verse of the Quran, however, makes it clear that there are many earths (see Quran 65:12). Is it possible that there may be other earths out there?

No one expects to find another earth within our solar system. But scientists say it is likely that in our galaxy there are many earths outside the solar system. They say that approximately 50 billion stars in the Milky Way rotate slowly, as does the sun. This characteristic indicates that those stars are surrounded by planets that are their satellites. The Bernard Star, for example, is believed to have at least one planetary companion. (see The Bible, the Quran and Science, p. 148). Dr. Bucaille quotes P. Guerin as follows: "All the evidence points to the fact that planetary systems are scattered in profusion all over the universe. The solar system and the earth are not unique" (p. 148-9).

In a recent article published in the Toronto Star, two scientists advanced evidence that there may indeed be many earths waiting to be discovered. The headline read: "Earths may be dime a dozen out there."

The Quran also uses the symbolic plural number 7 to indicate the existence of a plurality of heavens (see Quran 2:29, for example). Dr. Bucaille comments that this is "confirmed by modern science due to the observations experts in astrophysics have made on galactic systems and their very large number" (p. 150).

Once again we find that the Quran says something and scientists later discover it to be true. Can we resist believing in this book of God? God says: **"Those who disbelieve in the Reminder when it comes unto them**

(are guilty), for indeed it is an unassailable Scripture. Falsehood cannot come at it from before it or behind it. (It is) a revelation from the Wise, the Owner of Praise" (Quran 41 :41-42).

Chapter 9

ORGANIZATION OF THE UNIVERSE

What the Quran mentions about the organization of the Universe is important because "these references constitute a new fact of divine Revelation" (The Bible, the Quran and Science, p. 153). The Quran deals with this matter in depth although this is not dealt with in the previous scriptures.

Dr. Maurice Bucaille also points out the important fact that the Quran does not contain "the theories prevalent at the time of the Revelation that deal with the organization of the celestial world" (p. 153). If the Quran was authored by any human being, he or she would have naturally included the ideas prevalent at the time. But many of those ideas were later shown to be inaccurate. How did the author of the Quran know enough to exclude those ideas, unless the author is God himself.

Those who say that Muhammad authored the Quran think that the Arabs were very knowledgeable in the field of Science, and Muhammad was or course one of them. But this explanation is based on the incorrect assumption that the Arabs knew Science before the Quran was revealed. As pointed out by Dr. Bucaille, the fact is that Science in Islamic countries came after the Quran, not before. "In any case", writes Dr. Bucaille, "the scientific knowledge of that great period would not have been sufficient for a human being to write some of the verses to be found in the Quran" (The Bible, the Quran and Science, p. 1 53-1 54)

Modern astronomers are aware that the stars and planets are kept within ranges of precise distances from each other. Had it not been for this fact, collision between them would be inevitable. The author of the Quran was also aware of this. In the Quran we read "the sun and the moon (are subjected) to calculations (Quran 55:5).

Again, we read: **"For you (God) subjected the sun and the moon, both diligently pursuing their courses"** (Quran 14:33). The phrase

'diligently pursuing their courses' is a translation of the Arabic term daa'ib which here means 'to apply oneself to something with care in a perseverant, invariable manner, in accordance with set habits' (The Bible, the Quran and Science, p.l55). And that indeed is how the sun and moon behave.

Another verse in the Quran says, "the stars are in subjection to His command" (Quran 16:12). Order in the universe is essential for its preservation. God, who subjected them to that order knew about it before any scientist.

Chapter 10

WHAT HOLDS UP THE SKY?

Today scientists speak of gravitational forces that hold the heavenly bodies apart from each other and prevent them from colliding with each other. How was this to be conveyed to the first readers of the Quran? God tells us in the Quran that He is the One Who raised the sky (Quran 55:7) and that he holds it back from falling on the earth (Quran 22:65). But how exactly does God do this?

If the author of the Quran was a human being, it would have been very easy for the author to copy the answer to this question from the Bible. But today no one will believe that answer.

In the New American Bible, a picture is drawn to show how the authors of the Bible imagined the world to look like. In that picture, the sky "resembles an overturned bowl and is supported by columns" (The New American Bible, St. Joseph's Medium Size Edition, pp. 4-5). The earth in that picture is flat, and is also supported by pillars. After describing the picture at length, the editors of that Bible conclude by calling that idea of the world a "prescientific concept of the universe."

At the time when the Quran was being revealed, anyone could have easily believed this description which was already found in the Bible. It is only in modern times that people would know better. How did the author of the Quran avoid this mistake?

God says in the Quran that He created the heavens **"without any pillars that you can see" (Quran 31:10)**. Again, the Quran says: **"God is the One Who raised the heavens without any pillars that you can see" (Quran 13:2).** Dr. Maurice Bucaille comments: "These two verses refute the belief that the vault of the heavens was held up by pillars, the only things preventing the former from crushing the earth" (The Bible, the Quran and Science, p. 154).

To be able to avoid that prescientific error, the author of the Quran must have been either a modern scientist, or God Himself.

Chapter 11

COMPARING APPLES AND ORANGES

The sun and the moon are different from each other not only in terms of size, but also in terms of function. The sun generates light, but the moon does not. The moon merely reflects the light coming from the sun. Every high school student today knows this.

A man or woman in the seventh century, however, would not have known about this fine distinction between the sun and the moon. To such a person, the two would appear as a greater light and a lesser light. Such a person would observe that the greater light lights up the day and the lesser light lights up the night. And this indeed is how the sun and the moon were described in previous books.

The Bible, describing the creation, says: "God made two great lights the greater light to govern the day and the lesser light to govern the night" (Genesis 1: 16). The author of the Qur'an however, was aware that this comparison between the sun and the moon is not adequate. Therefore the Qur'an does not refer to them as being a greater and a lesser light.

The Qur'an says: **"God is the One who made the sun a shine and the moon a light" (Qur'an 10:5).**

Commenting on this, Dr. Bucaille says: "Whereas the Bible calls the sun and moon 'lights', and merely adds to one the adjective 'greater' and to the other 'lesser', the Qur'an ascribes differences other than that of dimension to each respectively" (The Bible, the Qur'an and Science, p. 156).

Similarly, the Qur'an says: "Blessed is the One Who placed the constellations in heaven and placed therein a lamp and a moon giving light" (Qur'an 25:61).

Here again, the difference between the sun and the moon is noted. The sun is called a lamp, and the moon is called an object giving light.

Again in the Qur'an God says that He **"made the moon a light" and**

"made the sun a lamp" (Qur'an 71:15-16).
Furthermore, God calls the sun a **"blazing lamp"** (Qur'an 78:12-13). This term which is used for the sun is never used for the moon in the Qur'an.
In all of these verses, God expresses the notion that the sun and the moon are "not absolutely identical lights" (The Bible, the Qur'an and Science, p. 156).

Dr. Bucaille draws his conclusions from what he found in the Qur'an about the sun and the moon: "What is interesting to note here is the sober quality of the comparisons, and the absence in the text of the Qur'an of any elements of comparison that might have prevailed at the time and which in our day would appear as phantasmagorial" (The Bible, the Qur'an and Science, p 157). In short, "There is nothing in the text of the Qur'an that contradicts what we know today about these two celestial bodies." (The Bible, the Qur'an and Science, p. 157).

Chapter 12

THE SUN & MOON AND THEIR ORBITS

Today we know that the Moon revolves around the earth in approximately 29.5 days. The sun also revolves in its own orbit. To understand the sun's orbit, Dr. Bucaille says that the position of the sun in our galaxy must be considered, and we must therefore call on modern scientific ideas (The Bible, the Qur'an and Science, p. 162).

Our galaxy, the milky way galaxy, includes one hundred billion stars situated in such a formation that the galaxy is shaped like a disc. This disc turns around its center like a gramophone record. Now, it is obvious that when a gramophone record turns, any point on the disc would move around and come back to its original position. Similarly, every star in the galaxy moves as the galaxy rotates on its axis. Therefore the stars that are away from the center of the galaxy orbit around the axis. The sun is one of those stars.

Dr. Bucaille explains that modern science has worked out the details of the sun's orbit as follows: "To complete one revolution on its own axis, the galaxy and the sun take roughly 250 million years. The sun travels roughly 150 miles per second in the completion of this" (The Bible, the Qur'an and Science, p. 162).

After describing this, Dr. Bucaille comments: "The above is the orbital movement of the sun that was already referred to in the Qur'an fourteen centuries ago." (The Bible, the Qur'an and Science, p. 162)

And yet this is a new finding. As Dr. Bucaille says, the knowledge of the sun's orbit is an acquisition of modern astronomy (The Bible, the Qur'an and Science, p. 162).

Two verses in the Qur'an refer to the orbits of the sun and moon. After mentioning the sun and the moon, God says: **"Each one is travelling in an orbit with its own motion" (Qur'an 21:33; 36:40).** How did the author of the Qur'an know of this? Even after the Qur'an was revealed, early

commentators could not conceive of the orbits of the sun and moon. The tenth century commentator Tabari could not explain this so he said, "It is our duty to keep silent when we do not know" (XVII, 15 quoted in The Bible, the Qur'an and Science, p. 161).

Dr. Bucaille comments: "This shows just how incapable men were of understanding this concept of the sun's and moon's orbit." (The Bible, the Qur'an and Science, p. 161).

From this it is clear that if the Qur'an was here expressing an idea already known to the people, the commentators would have easily understood it. But this, as Dr. Bucaille explains was "a new concept that was not to be explained until centuries later" (The Bible, the Qur'an and Science, p. 161)

This confirms what God said to his prophet, on whom be peace: **"This is of the tidings of the Unseen which we inspire in you (Muhammad). Neither you nor your people knew it before this" (Qur'an 11:49).**

THE SUN & MOON MOVE WITH THEIR OWN MOTION The Qur'an makes the following statement about the sun and the moon: **"Each one is travelling in an orbit with its own motion" (Qur'an 21:33; 36:40).**

Why did the Qur'an say that the sun and moon move with their own motion? And, if that is true, where did the author of the Qur'an get this information?

The fact is that the sun and moon rotate on their axes and are in part animated by this rotating motion. The phrase "travelling with its own motion" in the verses quoted above is a translation of the Arabic verb 'yasbahoon'. This could also be translated 'they swim.' In that case, the verse would read that the sun and the moon, "Each swim in its own orbit." Those who translate the verse this way explain that the term swim refers to movement with one's own internally generated force. Furthermore the movement of a swimmer is graceful, measured, and smooth. This is a very fitting description for the movement of the stars and planets including the sun and the moon.

After describing the scientific data concerning the rotation of the sun and the moon, Dr. Bucaille says: "These motions of the two celestial bodies are confirmed by the data of modern science, and it is inconceivable that a man living in the seventh century A.D… . could have imagined them" (The Bible, the Qur'an and Science, p. 163).

It is also amazing that the Qur'an uses a different term for the movement of the clouds and the mountains (see Qur'an 27:88). Obviously, the clouds and mountains are driven by external forces. The cloud is driven

by the wind and the mountains move with the rotation of the earth. The sun and moon, however, move with their own motion, and therefore the Qur'an uses a peculiar term "they swim" to refer to their smooth, graceful, self-propelled movement.
How did the author of the Qur'an know enough to make this choice of words that will reflect a modern scientific truth? The Qur'an is no less than a revelation from God.
sura 36, verse 40:
"The sun must not catch up the moon, nor does the night outstrip the day. Each one is travelling in an orbit with its own motion."
Here an essential fact is clearly stated: the existence of the Sun's and Moon's orbits, plus a reference is made to the traveling
of these bodies in space with their own motion. A negative fact also emerges from a reading of these verses: it is shown that the Sun moves in an orbit, but no indication is given as to what this orbit might be in relation to the Earth. At the time of the Qur'anic Revelation, it was thought that the Sun moved while the Earth stood still. This was the system of geocentrism that had held away since the time of Ptolemy, Sec-ond century B.C., and was to continue to do so until Copernicus in the Sixteenth century A.D. Although people supported this concept at the time of Muhammad, it does not appear anywhere
in the Qur'an, either here or elsewhere. 1. The Moon's Orbit.

Today, the concept is widely spread that the Moon is a satellite of the Earth around which it revolves in periods of twenty-nine days. A correction must however be made to the absolutely circular form of its orbit, since modern astronomy ascribes a certain eccentricity to this, so that the distance between the Earth and the Moon (240,000 miles) is only the average distance.
We have seen above how the Qur'an underlined the usefulness of observing the Moon's movements in calculating time (sura 10, verse 5, quoted at the beginning of this chapter.) This system has often been criticized for being archaic, im- practical and unscientific in comparison to our system based on the Earth's rotation around the Sun, expressed today in the Julian calendar.
This criticism calls for the following two remarks:

a) Nearly fourteen centuries ago, the Qur'an was directed at the inhabitants of the Arabian Peninsula who were used to the lunar calculation of time. It was advisable to address them in the only language they could understand and not to upset the habits they had of locating spatial and temporal reference-marks which were nevertheless quite efficient. It is

known how well-versed men living in the desert are in the observation of the sky; they navigated according to the stars and told the time according to the phases of the Moon. Those were the simplest and most reliable means available to them.

b) Apart from the specialists in this, most people are unaware of the perfect correlation between the Julian and the lunar calendar: 235 lunar months correspond exactly to 19 Julian years of 365.25 days. Then length of our year of 365 days is not perfect because it has to be rectified every four years (with a leap year): With the lunar calendar, the same phenomena occur every 19 years (Julian). This is the Metonic cycle, named after the Greek astronomer Meton, who discovered this exact correlation between solar and lunar time in the Fifth century B.C. 2. The Sun.

It is more difficult to conceive of the Sun's orbit because we are so used to seeing our solar system organized around it. To understand the verse from the Qur'an, the position of the Sun in our galaxy must be considered. and we must therefore call on modern scientific ideas. Our galaxy includes a very large number of stars spaced so as to form a disc that is denser at the centre than at the rim. The Sun occupies a position in it which is far removed from the centre of the disc. The galaxy revolves on its own axis which is its centre with the result that the Sun revolves around the same centre in a circular orbit. Modern astronomy has worked out the details of this. In 1917, Shapley estimated the distance between the Sun and the centre of our galaxy at 10 kiloparsecs i.e., in miles, circa the figure 2 followed by 17 zeros. To complete one revolution on its own axis, the galaxy and Sun take roughly 250 million years. The Sun travels at roughly 150 miles per second in the completion of this. The above is the orbital movement of the Sun that was already referred to by the Qur'an fourteen centuries ago. The demonstration of the existence and details of this is one of the achievements of modern astronomy. —The Moon completes its rotating motion on its own axis at the same time as it revolves around the Earth, i.e. 29.5 days (approx.), so that it always has the same side facing us. —The Sun takes roughly 25 days to revolve on its own axis.

There are certain differences in its rotation at its equator and poles, (we shall not go into them here) but as a whole, the Sun is animated by a rotating motion. It appears therefore that a verbal nuance in the Qur'an refers to the Sun and Moon's own motion. These motions of the two celestial bodies are confirmed by the data of modern science, and it is inconceivable that a man living in the Seventh century A.D.—however knowledgeable he might have been in his day (and this was certainly not

true in Muhammad's case)—could have imagined them. This view is sometimes contested by examples from great thinkers of antiquity who indisputably predicted certain data that modern science has verified. They could hardly have relied on scientific deduction however; their method of procedure was more one of philosophical reasoning. Thus the case of the Pythagoreans is often advanced. In the Sixth century B.C., they defended the theory of the rotation of the Earth on its own axis and the movement of the planets around the Sun. This theory was to be confirmed by modern sciece. By comparing it with the case of the Pythagoreans,it easy to put forward the hypothesis of Muhammad as being a brilliant thinker, who was supposed to have imagined all on his on his own what modern science was to discover centuries later. In so doing however, people quite simply forget to mention the other aspect of what these geniuses of philosophical reasoning produced, i.e. the colossal blunders that litter their work. it must be remembered for example, that the pythagoreans also defended the theory whereby the Sun was fixed in space; they made it the centre of the world and only conceived of a celestial order that was centered on it. It is quite common in the works of the great philosophers of antiquity to find a mixture of valid and invalid ideas about the Universe. The brilliance of these human works comes from the advanced ideas they contain, but they should not make us over look the mistaken concepts which have also been left to us. From a strictly scientific point of view, this is what distinguished them from the Qur'an. In the latter, many subjects are referred to that have a bearing on modern knowledge without one of them containing a statement that contradicts what has been established by present-day science.

Chapter 13

THE CONQUEST OF SPACE

From this point of view, three verses of the Qur'an should command our full attention. One expresses, without any trace of ambiguity, what man should and will achieve in this field. In the other two, God refers for the sake of the unbelievers in Makka to the surprise they would have if they were able to raise themselves up to the Heavens; He alludes to a hypothesis which will not be realized for the latter.

1) The first of these verses is sura 55, verse 33: **"O assembly of Jinns and Men, if you can penetrate regions of the heavens and the earth, then penetrate them! You will not penetrate them save with a Power."**

The translation given here needs some explanatory comment:

a) The word 'if' expresses in English a condition that is dependent upon a possibility and either an achievable or an unachievable hypothesis. Arabic is a language which is able to introduce a nuance into the condition which is much more explicit. There is one word to express the possibility (ida), another for the achievable hypothesis (in) and a third for the unachievable hypothesis expressed by the word (lau). The verse in question has it as an achievable hypothesis expressed by the word (in). The Qur'an therefore suggests the material possibility of a concrete realization. This subtle linguistic distinction formally rules out the purely mystic interpretation that some people have (quite wrongly) put on this verse.

b) God is addressing the spirits (jinn) and human beings (ins), and not essentially allegorical figures.

c) 'To penetrate' is the translation of the verb nafada followed by the preposition min. According to Kazimirski's dictionary, the phrase means 'to pass right through and come out on the other side of a body' (e.g. an arrow that comes out on the other side).

It therefore suggests a deep penetration and emergence at the other end into the regions in question.
d) The Power (sultan) these men will have to achieve this enterprise would seem to come from the All-Mighty. 'There can be no doubt that this verse indicates the possibility men will one day achieve what we today call (perhaps rather improperly) 'the conquest of space'. One must note that the text of the Qur'an predicts not only penetration through the regions of the Heavens, but also the Earth, i.e. the exploration of its depths.

2) The other two verses are taken from sura 15, (verses 14 and 15). God is speaking of the unbelievers in Makka, as the context of this passage in the sura shows: 'Even if We opened unto them a gate to Heaven and they were to continue ascending therein, they would say: our sight is confused as in drunkenness. Nay, we are people bewitched." The above expresses astonishment at a remarkable spectacle, different from anything man could imagine.

The conditional sentence is introduced here by the word lau which expresses a hypothesis that could never be realized as far as it concerned the people mentioned in these verses.
When talking of the conquest of space therefore, we have two passages in the text of the Qur'an: one of them refers to what will one day become a reality thanks to the powers of intelligence and ingenuity God will give to man, and the other describes an event that the unbelievers in Makka will never witness, hence its character of a condition never to be realized. The event will however be seen by others, as intimated in the first verse quoted above. It describes the human reactions to the unexpected spectacle that travelers in space will see: their confused sight, as in drunkenness, the feeling of being bewitched... This is exactly how astronauts have experienced this remarkable adventure since the first human space flight around the world in 1961. It is known in actual fact how once one is above the Earth's atmosphere, the Heavens no longer have the azure appearance we see from Earth, which results from phenomena of absorption of the Sun's light into the layers of the atmosphere.

The human observer in space above the Earth's atmosphere sees a black sky and the Earth seems to be surrounded by a halo of bluish color due to the same phenomena of absorption of light by the Earth's atmosphere. The Moon has no atmosphere, however, and therefore appears in its true colors against the black background of the sky. It is a completely new spectacle therefore that presents itself to men in space, and the photographs of this spectacle are well known to present-day man. Here

again, it is difficult not to be impressed, when comparing the text of the Qur'an to the data of modern science, by statements that simply cannot be ascribed to the thought of a man who lived more than fourteen centuries ago.

Chapter 14

THE SEQUENCE OF DAY AND NIGHT

At a time when it was held that the Earth was the centre of the world and that the Sun moved in relation to it, how could any one have failed to refer to the Sun's movement when talking of the sequence of night and day? This is not however referred to in the Qur'an and the subject is dealt with as follows:

sura 7, verse 54: "(God) covers the day with the night which is in haste to follow it... "

sura 36, verse 37: "And a sign for them (human beings) is the night. We strip it of the day and they are in darkness."

sura 31, verse 29: "Hast thou not seen how God merges the night into the day and merges the day into the night." sura 39, verse 5: "... He coils the night upon the day and He coils the day upon the night."

The first verse cited requires no comment. The second simply provides an image. It is mainly the third and fourth verses quoted above that provide interesting material on the process of interpenetration and especially of winding the night upon the day and the day upon the night. (sura 39, verse 5) 'To coil' or 'to wind' seems, as in the French translation by R. Blachere, to be the best way of translating the Arabic verb kawwara. The original meaning of the verb is to 'coil' a turban around the head; the notion of coiling is preserved in all the other senses of the word. What actually happens however in space? American astronauts have seen and photographed what happens from their spaceships, especially at a great distance from Earth, e.g. from the Moon. They saw how the Sun permanently lights up (except in the case of an eclipse) the half of the Earth's surface that is facing it, while the other half of the globe is in darkness. The Earth turns on its own axis and the lighting remains the same, so that an area in the form of a half-sphere makes one revolution around the Earth in twenty-four hours while the other half-sphere, that has remained in darkness, makes the same revolution in the same time.

This perpetual rotation of night and day is quite clearly described in the Qur'an. It is easy for the human understanding to grasp this notion nowadays because we have the idea of the Sun's (relative) immobility and the Earth's rotation. This process of perpetual coiling, including the interpenetration of one sector by another is expressed in the Qur'an just as if the concept of the Earth's roundness had already been conceived at the time-which was obviously not the case. Further to the above reflections on the sequence of day and night, one must also mention, with a quotation of some verses from the Qur'an, the idea that there is more than one Orient and one Occident. This is of purely descriptive interest because these phenomena rely on the most commonplace observations. The idea is mentioned here with the aim of reproducing as faithfully as possible all that the Qur'an has to say on this subject.

The following are examples:

—**In sura 70 verse 40, the expression 'Lord of Orients and Occidents'.**

—**In sura 55, verse 17, the expression 'Lord of the two Orients and the two Occidents'.**

—**In sura 43, verse 38, a reference to the 'distance between the two Orients'**, an image intended to express the immense size of the distance separating the two points.

Anyone who carefully watches the sunrise and sunset knows that the Sun rises at different point of the Orient and sets at different points of the Occident, according to season. Bearings taken on each of the horizons define the extreme limits that mark the two Orients and Occidents, and between these there are points marked off throughout the year. The phenomenon described here is rather commonplace, but what mainly deserves attention in this chapter are the other topics dealt with, where the description of astronomical phenomena referred to in the Qur'an is in keeping with modern data.

Chapter 15

THE EXPANSION OF THE UNIVERSE

The expansion of the Universe is the most imposing discovery of modern science. Today it is a firmly established concept and the only debate centres around the way this is taking place.

It was first suggested by the general theory of relativity and is backed up by physics in the examination of the galactic spectrum; the regular movement towards the red section of their spectrum may be explained by the distancing of one galaxy from another. Thus the size of the Universe is probably constantly increasing and this increase will become bigger the further away the galaxies are from us. The speeds at which these celestial bodies are moving may, in the course of this perpetual expansion, go from fractions of the speed of light to speeds faster than this.

The following verse of the Qur'an (sura 51, verse 47) where God is speaking, may perhaps be compared with modern ideas: "**The heaven, We have built it with power. Verily. We are expanding it."**

'Heaven' is the translation of the word sama' and this is exactly the extra-terrestrial world that is meant.

'We are expanding it' is the translation of the plural present participle musi'una of the verb ausa'a meaning 'to make wider,
more spacious, to extend, to expand'.

Ramidullah in his translation of the Qur'an talks of the widening of the heavens and space, but he includes a question mark. There are those who arm themselves with authorized scientific opinion in their commentaries and give the meaning stated here. This is true in the case of the Muntakab, a book of commentaries edited by the Supreme Council for Islamic Affairs, Cairo. It refers to the expansion of the Universe in totally unambiguous terms.

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"Wisdom is the lost property of the Believer,

let him claim it wherever he finds it"

Imam Ali (as)